CLAIMS:

I Claim:

1. In a motor vehicle, a control system for controlling an occupant restraint system, comprising:

a plurality of electronic sensors mounted at different locations on the vehicle, each of said sensors providing a measurement related to a state of said sensor or a measurement related to a state of the mounting location; and

a processor coupled to said sensors and arranged to diagnose the state of the vehicle based on the measurements of said sensors,

said processor being arranged to control the occupant restraint system based at least in part on the diagnosed state of the vehicle in an attempt to minimize injury to an occupant.

2. The vehicle of claim 1, wherein at least one of said sensors is selected from a group consisting of a single axis acceleration sensor, a double axis acceleration sensor, a triaxial acceleration sensor and a gyroscope.

3. The vehicle of claim 1, wherein at least one of said sensors includes an RF response unit, further comprising at least one RF interrogator device, said at least one interrogator device causing said RF response unit of said at least one sensor to transmit a signal representative of the measurement of said at least one sensor to said processor.

4. The vehicle of claim 1, wherein the state of the vehicle diagnosed by said processor includes angular motion of the vehicle.

5. The vehicle of claim 1, wherein the state of the vehicle diagnosed by said processor includes a determination of a location of an impact between the vehicle and another object.

6. The vehicle of claim 5, wherein said processor is structured and arranged to forecast the severity of the impact using the force/crush properties of the vehicle at the impact location and control the occupant restraint system based at least in part on the severity of the impact.

7. The vehicle of claim 1, wherein at least one of said sensors is a weight sensor coupled to a seat in the vehicle for sensing the weight of an occupying item of the seat, said weight sensor being coupled to said processor and said processor controlling the occupant restraint system based on the state of the vehicle and the weight of the occupying item of the seat sensed by said weight sensor.

8. The vehicle of claim 1, wherein said processor includes pattern recognition means for diagnosing the state of the vehicle.

9. The vehicle of claim 1, further comprising a display coupled to said processor for displaying an indication of the state of the vehicle as diagnosed by said processor.

10. The vehicle of claim 1, further comprising a warning device coupled to said processor for relaying a warning to an occupant of the vehicle relating to the state of the vehicle as diagnosed by said processor.

11. The vehicle of claim 1, further comprising a transmission device coupled to said processor for transmitting a signal to a remote site relating to the state of the vehicle as diagnosed by said processor.

12. The vehicle of claim 1, wherein the state of the vehicle includes angular acceleration, a plurality of said sensors comprising accelerometers such that said processor determines the angular acceleration of the vehicle based on the acceleration measured by said accelerometers.

13. The vehicle of claim 1, wherein at least one of said sensors comprises a high dynamic range accelerometer.

14. The vehicle of claim 1, wherein at least one of said sensors comprises a gyroscope including a surface acoustic wave resonator which applies standing waves on a piezoelectric substrate.

15. In a motor vehicle, a control system for controlling an occupant restraint system, comprising:

a plurality of sensors mounted at different locations on the vehicle, each of said sensors providing a measurement related to a state of said sensor or a measurement related to a state of the mounting location; and

a processor coupled to said sensors and arranged to diagnose the state of the vehicle based on the measurements of said sensors,

said processor being arranged to control the occupant restraint system based at least in part on the diagnosed state of the vehicle,

at least two of said sensors each being a sensor selected from a group consisting of a single axis acceleration sensor, a double axis acceleration sensor, a triaxial acceleration sensor and a gyroscope.

16. In a motor vehicle, a control system for controlling an occupant restraint system, comprising:

a plurality of sensors mounted at different locations on the vehicle, each of said sensors providing a measurement related to a state of said sensor or a measurement related to a state of the mounting location; and

a processor coupled to said sensors and arranged to diagnose the state of the vehicle based on the measurements of said sensors, said processor including pattern recognition means for diagnosing the state of the vehicle and being arranged to control the occupant restraint system based at least in part on the diagnosed state of the vehicle.

17. In a motor vehicle, a control system for controlling a navigation system, comprising:

a plurality of sensors mounted at different locations on the vehicle, each of said sensors providing a measurement related to a state of said sensor or a measurement related to a state of the mounting location; and

a processor coupled to said sensors and arranged to diagnose the state of the vehicle based on the measurements of said sensors, the state of the vehicle diagnosed by said processor including angular motion of the vehicle whereby angular position or orientation are derivable from the angular motion,

said processor being arranged to control the navigation system based on the angular acceleration of the vehicle.

18. A method for controlling an occupant restraint system in a vehicle comprising the steps of:

mounting a plurality of electronic sensors at different locations on the vehicle;

measuring a state of the sensor or a state of the respective mounting location of the sensor;

diagnosing the state of the vehicle based on the measurements of the state of the sensors or the state of the mounting locations of the sensors, and

controlling the occupant restraint system based at least in part on the diagnosed state of the vehicle in an attempt to minimize injury to an occupant in the event of a crash.

19. The method of claim 18, wherein the state of the sensor is the acceleration, angular motion, angular velocity or angular orientation of the sensor.

20. The method of claim 18, wherein the state of the vehicle is diagnosed by a processor, further comprising the steps of:

providing at least one of the sensors with an RF response unit;

mounting at least one RF interrogator device on the vehicle; and

transmitting signals via the at least one RF interrogator device to cause the RF response units of the at least one sensor to transmit a signal representative of the measurements of the at least one sensor to the processor.

21. The method of claim 18, wherein the step of diagnosing the state of the vehicle comprises the step of determining whether the vehicle is stable or is about to rollover or skid.

22. The method of claim 18, wherein the step of diagnosing the state of the vehicle comprises the step of determining a location of an impact between the vehicle and another object.

23. The method of claim 22, further comprising the step of forecasting the severity of the impact using the force/crush properties of the vehicle at the impact location, the occupant restraint system being controlled based at least in part on the severity of the impact.

24. The method of claim 18, further comprising the step of sensing the weight of an occupying item of a seat of the vehicle, the occupant restraint system being controlled based at least in part on the weight of the occupying item of the seat.

25. The method of claim 18, further comprising the step of displaying an indication of the state of the vehicle.

26. The method of claim 18, further comprising the step of relaying a warning to an occupant of the vehicle relating to the state of the vehicle.

27. The method of claim 18, further comprising the step of transmitting a signal to a remote site relating to the state of the vehicle.

28. The method of claim 18, wherein a plurality of the sensors comprise accelerometers, the step of diagnosing the state of the vehicle comprises the step of determining angular motion of the vehicle based on the acceleration measured by said accelerometers.

29. A method for controlling an occupant restraint system in a vehicle comprising the steps of:

mounting a plurality of electronic sensors at different locations on the vehicle;

measuring a state of the sensor which is the acceleration, angular acceleration, angular velocity or angular orientation of the sensor;

diagnosing the state of the vehicle based on the measurements of the state of the sensors or the state of the mounting locations of the sensors, and

controlling the occupant restraint system based at least in part on the diagnosed state of the vehicle in an attempt to minimize injury to an occupant in the event of a crash.

30. A method for controlling an occupant restraint system in a vehicle comprising the steps of:

mounting a plurality of electronic acceleration sensors at different locations on the vehicle;

measuring a state of the sensor or a state of the respective mounting location of the sensor;

diagnosing the state of the vehicle based on the measurements of the state of the sensors or the state of the mounting locations of the sensors, the step of diagnosing the state of the vehicle comprises the step of determining angular motion of the vehicle based on the acceleration measured by said acceleration sensors; and

controlling the occupant restraint system based at least in part on the diagnosed state of the vehicle in an attempt to minimize injury to an occupant in the event of a crash.

31. A method for controlling a navigation system in a vehicle comprising the steps of:

mounting a plurality of sensors at different locations on the vehicle;

measuring a state of the sensor or a state of the respective mounting location of the sensor;

diagnosing the state of the vehicle based on the measurements of the state of the sensors or the state of the mounting locations of the sensors, the step of diagnosing the state of the vehicle comprising the step of determining angular motion of the vehicle whereby angular position or orientation are derivable from the angular motion; and

controlling the navigation system based at least in part on the diagnosed state of the vehicle in an attempt to minimize injury to an occupant in the event of a crash, the step of controlling the at least one part comprising the controlling the navigation system based on the angular acceleration of the vehicle.